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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,846	08/02/2001	Takashi Ohno	210159US0CONT	5030
22850	7590	01/16/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			ANGEBRANNDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 01/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/919,846	OHNO ET AL.	
	Examiner	Art Unit	
	Martin J Angebrannt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/9/03, 10/15/03 & 11/17/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-13 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-13 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ***. | 6) <input type="checkbox"/> Other: _____ |

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1. The response provided by the applicant has been read and given careful consideration. The terminal disclaimer is proper and has been entered. The translations perfect priority and obviates the art rejection based upon Ohno et al. '352. The applicant should submit clean copies of PTO-1449, rather than ones, which have been previously initialed with respect to another application to avoid degrading the record and reducing the quality of the work product.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5-13 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori et al. JP 01-303643, in view of Hirotsune et al. '978 and Takada et al. '808, further in view of Morimoto et al. EP 0195532.

Fujimori et al. JP 01-303643 teaches the use of optical recording layers described by formula shown in the abstract. See the compositions set forth in example 1 (page 6/lower right column. Translation at page 19). The reference discloses that the use of Ag, In, Sn, Pb and Zn results in high speed erasure (page 8, lower left column, lines 9-20, particularly lines 9, 11, 16 and 17, translation on page 27), which the use of Se or Si results in increased stability of the amorphous phase. Useful protective layers are disclosed on pages 4 and 9 and include ZnS and SiO₂. The elements added to TeSb recording layers is disclosed as acting as a crystallization nucleus and increases the rate of crystallization (page 14 of translation) and allows high speed erasure, reduced noise and improved S/N (page 15 of translation). The addition range is less

than 20 Atomic % to reduce phase separation. (page 15 of translation). The initialization process converts the medium from the amorphous to the crystalline state (translation at page 21). The addition of Ge is disclosed as stabilizing the amorphous state and increasing the stability of the marks. (page 7 of translation). The performance of the medium near the point where the Te content is 10-30% result in improved performance, increased reflectivity differences between the crystalline and amorphous states, etc. (page 13 of translation). The amorphous state is stabilized and the crystallization speed is disclosed as increased by the addition of the third element to the SbTe medium. (page 14 of the translation)

Hirotsune et al. '978 teaches the use of pure elements including Si, Ge, C, Au, Ag, Al, Ni, Fe, Co, Cr, Ti, Pd, Pt, W, Ta, Mo and Sb, alloys layers of the alloys, multilayers of the layers and composite layers with oxides or similar materials. (11/59-65, 51/48-52 and 57/44-49) Useful recording layers include GeTeSb based films with various additives as set forth in formula 2 and the text following it for the reasons given, including increased erasure speed, higher C/N, oxidation resistance and flow speed. (3/10-25 and 4/8-39) The use of dielectric layers including multilayers is disclosed. (10/63-11/42 and 14/55-15/42). Useful amounts of elements added to GeSbTe, such as Ag, Zn and In include from 0.03 to 0.3. (5/25-34 and 2/63-3/26). The use of reflective layer is disclosed. (11/59-65).

Takada et al. '808 teach the use of mark length recording with phase change optical recording media. The power of the laser is modulated according to the formulae shown in columns 7-13. These allow effective recording at different linear velocities. (4/59-5/60) The use of this recording technique with media embraced by the formula described in column 5/line 65-column 6/line 6. The use of EFM is also disclosed with respect to figures 15a-c. Useful

recording layer compositions and the thicknesses of the recording layer and upper dielectric layer being 15-30 and 10-30 nm respectively are disclosed. (13/26-34 and 18/23-36) The thickness of the recording layer is disclosed. (19/1-8) The composition (19/17-22/18) and thicknesses of the protective dielectric layers are disclosed (22/19-42) Useful reflective layers and thicknesses are disclosed. (22/43-53).

Morimoto et al. EP 0195532 teaches that in addition to Ge, Te and Sb, the incorporation of other metals may be desirable. Zn, Se, Sn, Pb, In are disclosed as increasing sensitivity (page 14) The use of compositions set forth in the formula on page 12. The use of metallic compounds to form protective layers on either side of the recording layer is disclosed. (pages 20-21). The structure of optical recording media is shown in figure 14. The use of reflective layers is also disclosed. (pages 19 and 20).

It would have been obvious to one skilled in the art to add other elements disclosed on page 8 of Fujimori et al. JP 01-303643 other than Ge in an amount of less than 20 at% to gain improvements in amorphous phase stability and adjust crystallization speed and to use the rapid cooling structure known in the art as evidenced by Hirotsune et al. '978 to increase cycle ability (overwrite characteristics) with thicknesses in the range taught by Takada et al. '808 and to use the recording technique disclosed by Takada et al. '808 as improved in place of that used in the examples of Fujimori et al. JP 01-303643. Further the examiner holds that it would have been obvious to one skilled in the art to replace a portion of the Ge with Zn based in the resulting media based upon the disclosure within Fujimori et al. JP 01-303643 and to modify the invention of Fujimori et al. JP 01-303643 by adding a reflective layer and protective layers as taught by Hirotsune et al. '978 to provide protection for the recording layer and the reflective layer to

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allow the medium to be read using reflectivity. Further the desirability of adding Zn appears in Morimoto et al. EP 0195532 which emphasizes the desirability of adding Zn to GeTeSb compositions, specifically to increase the sensitivity of the compositions.

The applicant argues that the prior art does not suggest the facilitation of initialization by the addition of Zn or Ge to TeSb media and that Ge additionally increases the stability of the amorphous state. This is incorrect. The addition of a third element to TeSb media is disclosed on page 14 of the translation as resulting in stabilization of the amorphous state due to a raising of the crystallization temperature and an increase in the crystallization speed. As the erasure and initialization are both amorphous to crystalline transitions, the increase in the speed of these transitions by the addition of the third element facilitates them. Therefore the argued positions in the response merely point to benefits already ascribed to these materials. The Fujimori et al. JP 01-303643 clearly limits the amount of the additives to within the range set forth in the claims and is one to more than one of the additives and further, the benefits of the addition of Zn to GeSbTe containing compositions in terms of increased sensitivity are disclosed in Morimoto et al. EP 0195532 and Hirotsune et al. '978 encourages four element compositions containing SbTe and Ge or In combined with another element, one of which can be Zn (formula 2).

Additionally, the declaration seems to teach that the $\text{Te}_{30}\text{Sb}_{70}$ with excess Sb.

4 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

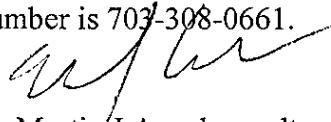
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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9309 for regular communications and 703-872-9309 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt
Primary Examiner
Art Unit 1756

January 8, 2004